



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

H.A

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/525,155

09/22/2005

Jeremie Andrieu

2002P13491WOUS

5669

7590

01/11/2008

Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER

BARON, HENRY

ART UNIT

PAPER NUMBER

2616

MAIL DATE

DELIVERY MODE

01/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/525,155	<b>Applicant(s)</b> ANDRIEU ET AL.	
	<b>Examiner</b> Henry Baron	<b>Art Unit</b> 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) ✓  
Paper No(s)/Mail Date 2/18/2005
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### ***DETAILED ACTIONS***

#### ***Claim Objection***

1. Claims 14 and 15 are objected to because of the following informalities: The claims cite 'link freedom' in respect of the links between nodes of the class. However the specification cites 'loop freedom' i.e. abstract and 2: [0013]. The Examiner believes that this is a typographical error and will examine the application with respect to loop freedom.
2. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(b) that form the basis for the rejections under this section made in this Office action:
4. A person shall be entitled to a patent unless –
5. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
6. Claims 10 – 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Alfonsi, et al (U.S. Patent 5,491,690).
7. In consideration of claim 10, Alfonsi teaches a method for defining a distribution fan-out for the distribution of traffic via different paths in a packet network formed by nodes and connection sections for packet traffic having the same egress node, comprising dividing the nodes into classes determined according to the minimum number of hops between the nodes and the egress node, whereby nodes with the same minimum number of hops belonging to the same class; and routing from each node of a class at least one link to a node of a class having one fewer hop. (15: [0025] read [t]he path between two nodes in the network is considered as optimum if the number of hops is minimum. All optimum paths create a tree of which root is the source node. FIG. 6 shows all the optimum paths established from node A. At the first level i.e. class, are placed all nodes adjacent to the source node, then at the second level i.e. class, all the adjacent nodes to the first level nodes and not already placed and so on until exhaustion. FIG. 7

Art Unit: 2616

illustrates the path search from node A to node E according to the present invention. As previously described, the eligible links to reach node E i.e. egress node, are defined in the table TA. Note Figure 7 shows exemplary nodes belonging to three classes and table TA enumerates routing from each node of a class to at least one link to a node of a class having one fewer hop)

8. In reference to claim 11, Alfonsi teaches where from each node of a class a link is routed along each connection section to a node of the class having one fewer hop. (see Figure 7.).

9. In consideration of claims 12 and 13, Alfonsi teaches where for at least one node of a class that is connected by a connection section to a node of the same class; at least one link between the node and a node of the same class is defined. (4: [0024]+ read [t]he reduction of routing table length is achieved through a hierarchical partitioning of the network. Basically, an m-level hierarchical clustering of a set of nodes (FIG. 9) consists in grouping the nodes (002) into a 1st level clusters (003), which in turn, are grouped into 2nd level cluster etc. and Figure 5 and 7 nodes W,T, and X e.g. one node of a class i.e. one hop, that is connected by a connection section to a node of the same class i.e. node T and X; at least one link between the node and a node of the same class is defined i.e. node X and W.).

### *Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 14 –15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfonsi, et al (U.S. Patent 5,491,690), in view of Zaumen (U.S. Patent 5,881,243).

12. Regarding claims 14 and 15, Alfonsi teaches of defining links on connection sections between nodes of a class, where links are defined according to a maximization of the number of outgoing logical links or as many possible outgoing links (Figure 7).

Art Unit: 2616

13. However, Alfonsi does not teach of defining links on connection sections between nodes of a class with regard to loop freedom.

14. Zauman teaches of defining links on connection sections between nodes of a class with regard to loop freedom. (Figure 5 and 5: [0010]+ read ) FIG. 5 classifies the nodes in a network according to the state of the routing tables in nodes. The region C.sub.j consists of those nodes i.e. nodes of a class that have a path to destination j, i.e. nodes of another class. 2: [0053]+ read .. algorithms eliminate counting to infinity, and the loop-free path finding algorithm by Garcia-Luna-Aceves and Murthy eliminates routing loops as well.).

15. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the teachings of fan-out distribution teachings of Alfonsi with the loop-free teachings of Zauman.

16. Advantageously, such a modification would allow same class nodes to be configured in an optimal way so that broadcast storms are avoided.

17. Claims 18 – 21, 24 – 26, and 27 – 29 are rejected as being unpatentable over Alfonsi, et al (U.S. Patent 5,491,690), in view of Cain (U.S. Patent 4,905,233).

18. With regards to claims 18 – 21, Alfonsi teaches the limitations of claims 10, 11, 12, and 13 respectively, but does not disclose the case of a node which is assigned to a class with at least two outgoing links, and in the event of failure of one of the outgoing links, the traffic to be routed via this link is distributed onto the other outgoing link or links.

19. Cain teaches of the case of a node which is assigned to a class with at least two outgoing links, and in the event of failure of one of the outgoing links, the traffic to be routed via this link is distributed onto the other outgoing link or links. (Figures 4a-b and 8: [0010]+ read FIGS. 4(a) and 4(b) provides an example where no reaction is required. The network is first depicted as at the end of FIGS. 2(a)-2(f), with

Art Unit: 2616

the addition that link (D, E) is marked as failing. Since all nodes still have downstream links following the failure, no transmissions are required.).

20. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the teachings of fan-out distribution teachings of Alfonsi modified by Zaumen with the alternate route teachings of Cain.

21. Advantageously, with this modification traffic can seamlessly be rerouted from a node across an operational outgoing link in the event that one of the outgoing links fail.

22. With regards to claims 24, 25, and 26, Alfonsi teaches the limitations of claims 10, 11 and 12 respectively.

23. However, Alfonsi does not teach of the case where a node assigned to a class has one outgoing link and in the event of failure of the outgoing link, the directions of all the links coming into it and originating at nodes of the same class are inverted, and should no links coming into it and originating at nodes of the same class exist, all the links coming into it are inverted.

24. Cain teaches of the case where a node assigned to a class has one outgoing link and in the event of failure of the outgoing link, the directions of all the links coming into it and originating at nodes of the same class are inverted, (Figures 5a-5e) and should no links coming into it and originating at nodes of the same class exist, all the links coming into it are inverted.(7: [0030]+ read ..the same reference level (which has been "reflected" i.e. inverted) has propagated to node i from all of its neighbors, but the reference level was not defined by node i.... Node i defines a new reference level. Following determination of its new height in cases 1, 2, 3, and 5, node i updates all the entries in its link-state array LS, and broadcasts an UPD packet to all neighbors  $j \in N_{sub.i}$ . The UPD packet consists of the new height of the node i which is broadcasting the packet,  $H_{sub.i}$ . When a node i receives an UPD packet from a neighbor  $j \in N_{sub.i}$ , node i first reacts as described in the prior description of creating routes. If the initial

Art Unit: 2616

processing causes a link reversal i.e. inverts and node i loses its last downstream link-then it modifies its height as outlined in the cases above.)

25. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the teachings of fan-out distribution teachings of Alfonsi modified by Zaumen with the link reversal teachings of Cain.

26. Advantageously, with this modification, traffic to and from a node where one or more links are severed can be seamlessly redirected while maintaining service the end user.

27. With regards to claims 27, 28, and 29, teaches Alfonsi teaches the limitations of claims 10, 11 and 12 respectively.

28. However, Alfonsi does not teach of the event of failure of an outgoing link of a node assigned to a class, the class of the node is redefined if the duration of the failure exceeds a limit value.

29. Cain teaches of the event of failure of an outgoing link of a node assigned to a class, the class of the node is redefined if the duration of the failure exceeds a limit value. (6: [0019] read When a node i receives an UPD packet from a neighbor j.  $\epsilon_{N.sub.i}$ , node i first updates the entry  $HN.sub.i,j$ , in its height array with the height contained in the received UPD packet and then reacts as follows: (a) If the route-required flag of the receiving node is set and the height contained in the received UPD packet is non-NULL with  $r=0$ , it sets its height to  $H.sub.i = (T.sub.j, oid.sub.j, r.sub.j, \Delta.sub.j + 1, i)$ , where  $HN.sub.i,j = (T.sub.j, oid.sub.j, r.sub.j, \Delta.sub.j, j)$  is the height contained in the received UPD packet, updates all the entries in its link-state array LS, unsets the route-required flag and broadcasts an UPD packet that contains its new height. (b) If the above condition does not hold true, the receiving node simply updates the entry  $LS.sub.i,j$  in its link-state array.)

30. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the teachings of fan-out distribution teachings of Alfonsi with the update teachings of Cain.

Art Unit: 2616

31. Advantageously, with this modification, traffic to and from a node where one or more links are severed the node can be redefined in a timely manner.

32. Claims 16 – 17 and 22 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfonsi, et al (U.S. Patent 5,491,690), in view of Zaumen (U.S. Patent 5,881,243) and in further view of Cain (U.S. Patent 4,905,233).

33. Regarding claims 16 and 17, Alfonsi with modification from Zauman teaches the limitations of claims 14 and 15 respectively. Alfonsi with modification from Zauman do not disclose nodes sequenced according to the number of outgoing links and, if nodes have the same number of outgoing links, according to the capacity of the incoming links, and performing for at least some of the nodes, depending on their sequence: identifying the shortest path from the node to the set of nodes of the class which is fewer by one, paths via outgoing links leading directly to nodes of the class N-1 being disregarded, and incorporating the link via the first connection section of the identified path into the distribution fan-out as a link, if an identified path does not lead to a loop within the nodes of the class. (6: [0036] read [a]n example of the creating routes process is illustrated in FIGS. 2(a)-2(f). The respective heights are shown adjacent to each node, and the destination for which the algorithm is running is marked DEST. A circle around a node indicates that its route-required flag is set. Recall that the last value in each height is the unique ID of the node, and that lexicographical ordering is used to direct links i.e. sequence and (2: [0065] read ..TORA (Temporally Ordered Routing Algorithm) is "source initiated" and creates a set of routes to a given destination only when there is message traffic for that destination. It guarantees all routes are loop-free, and typically provides multiple routes for any source/destination pair that requires a route.).

34. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the teachings of fan-out distribution teachings of Alfonsi modified by Zaumen with the loop free sequence teachings of Cain.



Art Unit: 2616

35. Advantageously, with this modification, the set of nodes within a class or same height level will have the minimum number of loop-free outgoing links so in the event of failed outgoing link, the links of the node can be easily redirected.

36. With regards to claims 22 and 23, Alfonsi in modification with Zaumen teaches the limitations of claims 16, but does not disclose the case of a node which is assigned to a class with at least two outgoing links, and in the event of failure of one of the outgoing links, the traffic to be routed via this link is distributed onto the other outgoing link or links.

37. Cain teaches of the case of a node which is assigned to a class with at least two outgoing links, and in the event of failure of one of the outgoing links, the traffic to be routed via this link is distributed onto the other outgoing link or links. (Figures 4a-b and 8: [0010]+ read FIGS. 4(a) and 4(b) provides an example where no reaction is required. The network is first depicted as at the end of FIGS. 2(a)-2(f), with the addition that link (D, E) is marked as failing. Since all nodes still have downstream links following the failure, no transmissions are required.).

38. It would have been obvious at the time the invention was made by a person of to having ordinary skill in the art to modify the teachings of fan-out distribution teachings of Alfonsi modified by Zaumen with the alternate route teachings of Cain.

39. Advantageously, with this modification traffic can seamlessly be rerouted from a node across an operational outgoing link in the event that one of the outgoing links fail.

#### ***Conclusion***

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Baron whose telephone number is (571) 270-1748. The examiner can normally be reached on 7:30 AM to 5:00 PM E.S.T. Monday to Friday.

Art Unit: 2616

41. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HB

HB

*Seema S. Rao*  
SEEMA S. RAO 1/7/08  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2000